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AN
ELEVENTH
LETTER
TO SIR JOSEPH BANKS Baronet
President of the Royal Society,
ON THE
Subject of Cochineal Insects, discovered at Madras,

By JAMES ANDERSON M. D.

With a Copper Plate Engraving Annexed, of the different INSECTS mentioned in the Letters, from the Drawings of BARON REICHEL.

Also an Engraving of the *Opuntia Major Spinulis obtusis mollibus, & innocentibus*, and the Plan of a Nopalry in the Bishoprick of Guaxaca in the Kingdom of Mexico, Extracted from the Second Volume of SIR HANS SLOANE'S HISTORY OF JAMAICA, for the use of Country Gentlemen who may be disposed to make Plantations, and are not in possession of that Work.

MILESTIA MAGNO
VELLERA MUTENTUR, TYRIDES INCOCTA RUBORES.
VIRG. GEOR. LIB. 3.

MADRAS: Printed by CHARLES FORD;

MDCCLXXXVII.



TO SIR JOSEPH BANKS Baronet

President of the Royal Society.

DEAR SIR,

NOT being able to procure the Philosophical Transactions for 1781 on this Coast; an ingenious and esteemed friend Colonel Pearce of Bengal, transmitted me an Extract of the accurate description of the *Lac* Insect, given by Mr. KEIR of PATNA, by the perusal of which I perceive the *Lac* is found on four different kinds of Trees in that Country.

The reason I mention this circumstance is, that I think a more specific method of distinguishing the species of Insects should be attempted, than merely annexing the name of the Plant on which they are found, to the generic name, as has hitherto been the custom of Naturalists.

No *Lac* is found here on any of the Trees Mr. KEIR mentions excepting the *Rhamnus* of which I can speak with more precision, having in the year 1769, and 1770 (when no Writer had appeared besides the credulous Bontius;) found *Lac* sometimes on the *Rhamnus*, *Spondius Myrobalanus* or *Caracay*, and *Gbika* of the *Tamuls*; but more frequently and in greater abundance, on the *Mimosa Intsia*—Linn. S. N. p. 678. *Corunda* of the *Sbastrum*, *Yerrachiki* of the *Talingas* or *Iia* of the *Tamuls* which the Natives of this Country Plant as a Barrier against surprise from their Enemies, for which it is well adapted, its branches covered with recurvated Thorns spreading over the ground like a Bramble.

Frequently too *Lac* is found on the *Mimosa Nilotica* or *Tumma* of the *Tamuls*, as well as on the *Mimosa Madraspatensis*, or *Pee Veli* of the *Tamuls* and several other (the *Warrateray*, *Shikrain*, and *Murkeley*) thorny *Mimosas*.

Whether the *Lac* Insect here, and the *Lac* Insect of Bengal, are the same, or different species, is not my present purpose to enquire, nor what effects a difference of Climate may produce, but seeing the Character of the Genus *Coccus* founded by the comprehensive Linnaeus, *Systema Naturæ* p. 538. N°. 229 on the Beak in the Breast of the Female, and Hairs at the extremity of the Abdomen of the Male, I determined to observe with the Microscope, the different Structure of these parts, as the Basis of a specific distinction.

With this view I solicited Major Spangenberg, who has arrived at great precision in the use of a double Microscope of Professor Ledermüllers construction, to assist me, and the result of our observations were as follows.

The

On examining the beak or *Rostrum Pectorale* of many of the female *Phyllanthus Emblica* Insects, we found two hairs similar to those described by Doctor GARDEN of South Carolina, and also a Cylindrical style issuing from the very Centre of its *Apex* possessed of Muscular motion in all directions, in the manner of the Tongue of such Reptiles as the Snake, Lizzard, *Manis* &c.

The process of clearing off the Silk from the Insects to prepare them for being viewed was frequently attended with the loss of the hairs, which are by these means torn off, and the Insect withdrawing its Tongue, nothing appeared but the *Rostrum*, which in this Insect is a Cone, the *Apex* of which is acute.

On this account we placed some young Insects, that had been but a few days from the shell, under the Microscope, and found on the *Rostrum* a Filament, which was twice as long as the whole Insect, and terminated in a little Button or Knob like the *Antennæ* of a Butterfly, and when the Insect crept about, we perceived the Filament dragging after it, like a *Funis Umbilicalis*.

Taking afterwards some of a larger size, about quarter grown, at which period they begin to fasten to the leaf, and are covered with a white *Pellicle*, or *Farina*, but have not yet begun to spin, we could not perceive any button or knob, but in place thereof found that the Filament was split at the extremity, appearing there to be two hairs.

I have frequently observed that full grown Insects stripped of their Silk, and put under the Microscope for examination, have in the course of one night covered themselves again with Silk, from whence it is obvious they can throw off the threads in all directions; but we could not perceive the particular manner in which this was effected.

The *Setæ* or Bristles mentioned in my Letter of August 1st, seem now to be nothing more than short hairs with which the *Punctum Subulatum* is furnished in the same way as the Legs of the Insect, on all of which that I have seen there are likewise short hairs.

You will readily perceive from the various appearances on the *Punctum Subulatum* it is too minute an object to admit certain characters being deducted from its structure; and although I have now relinquished every idea on this ground, I thought it might afford you some satisfaction to be acquainted with the attempts I have made, to find a specific character independant of the Plants on which Insects are found.

That I have not been altogether without success, appears from the *oviparous* nature of this Insect, which may serve as a specific distinction.

I also exposed the *Guava Coccus* to a great magnifying power, and discovered its eyes prominent and black, one on each side immediately below the insertion of the *Antennæ*, which I imagined might be used as a specific distinction, but reflecting on the probability, that there are eyes in all female *Coccus* Insects, though hitherto unobserved, and as this Insect was frequently minutely examined under the Microscope before, without making any such discovery, I laid aside the idea; and finding

finding no material difference between the *Rostrum Pectorale* of this and the *Phyllanthus* Insect, with which it also agrees, in Spinning a Filament of very fine Silk, to entangle and keep together the deciduous Hairs mentioned in my letter of the 20th of March, I have been unable to fix on any other Character, than the remarkable Hairyness of this Insect, on which to found a specific distinction.

However tedious this account may appear, considering the various Trees on which Insects are found, as well as different kinds on the same Tree; I am clearly of opinion this method is absolutely necessary to discriminate the *Coccus* Insects mentioned in the Letters I have had the honor to address you.

To the *Coccus* of the *Phyllanthus Emblica* therefore I would apply the specific name *Oogenes* and to the *Guava Coccus* the specific Name *Trichodes*.

It is worthy of remark, that the generic name *Coccus*, is defined by LEXICOGRAPHERS to mean the Tyrian dye, which combats the notion of the *Murex* ever having been used for this purpose.

The perusal of the following Letters will furnish a more adequate idea of the progress of my enquiries.

Munsoorcotta by Ganjam, August 31st, 1787.

DEAR SIR,

" I AM happy to inform you, that since I had the pleasure of writing I have discovered the grass Insect in great quantities, and shall agreeable to your desire collect and cure as many as possible, which I doubt not from the present appearance will be considerable.

" I imagined that the Insect was to be found, on the luxuriant grass on the low wet ground, but I find it is to be seen only on the dry eminencies with short grass; Mr. Richardson tells me, that he has observed an Insect, on the *Guava Trees* at Ganjam and at Aska; as it will no doubt be agreeable to you to know how far to the northward the Insect is to be found, it is my intention to send one of the people who have been employed in collecting the eggs, to ascertain if it exists towards Cattac and Balasore.

" As your Letter of the 8th only came to hand two days ago, I have not yet been able to get people to look for the *Opuntia* Thistle, but I expect two or three Black Doctors in a few days, and I have no doubt, if it exists in this quarter, but that it will be brought to me.

* You

" You may depend that no pains or expence shall be wanting on my part, and as I have seen
" the Plants you have sent to Ganjam, they will be a guide to me in my enquiries.

I am &c.

ALEXANDER ANDERSON.

Aska 3d, September 1787.

" DEAR SIR,

" I HAVE received all your Letters to SIR JOSEPH BANKS, on the subject of the Cochineal
" Insect, and Mr. Fannin has sent me some of the *Opuntia* Plants, which seem to thrive here exceed-
" ing well—In a day or two I purpose going in search of the *Opuntia Major Spinulis Obtusis*, a
" Bramin of this place gives me hopes of finding it in a Jungle about twenty miles off, and you shall
" know whether I meet with success.

" I observe by your Letter of July 18th, that the *Guava* Insects were not then to be found at
" Madras they are here at this present time in great plenty, I saw them likewise at Ganjam about
" a week ago, but not in such numbers, the violent winds which generally prevail there, renders
" that place I imagine less favourable to them.

" At Aska the weather is generally moderate, we scarcely suffer any thing from the S. E. winds,
" that are so destructive along the Coast, and the earth is covered with constant verdure by the
" frequent rains, which fall from the beginning of April (sometimes earlier) till the month of
" November.

" I have not been able to find any of the grafts Eggs, although I have made particular enquiries,
" but perhaps I may meet with more success after the Rains."

I am &c.

JAMES RICHARDSON.

* * I have issued the Letters and Copper Plate Engravings in every accessible part of this
Peninsula, and sent them likewise to Francis Light Esq. Governor of Poole-Pinang now Prince of
Wales's Island, to Doctor Duncan at Canton, the French Islands, Batavia, and Sumatra.

Don Feliciano Antonio, Governor of Timor has done me the favor to accept Copies for his own
perusal, and encouraged me to hope he will be able to communicate them at Botany Bay.

By the present conveyance of J. Cox Hippley, Esq. who proceeds to Europe on a Ship from
Pondicherry, I have requested Copies to be distributed at the Cape of Good Hope, and will send
others to Arabia and Persia when opportunities offer.

The

The indefatigable KONING found the Jesuits Bark Tree growing at Mount Ophir near Malacca, and many of the American Trees and Plants described by Hernandez, Rhedi, and Lynceus, being Indigenous here, there is great probability the Cochineal Thistle may likewise be found.

Sir Charles Linnæus had the Insect he describes from Dr. Rolander at Surinam, and Mr. Ellis that he mentions in the Philosophical Transactions, from Dr. Garden at Charles Town; but I cannot be persuaded, the want of hands in South Carolina would ever prevent our American Countrymen from cultivating them as he surmises, no more than it would the Dutch at Surinam.

The fact undoubtedly is, either that the Insects they mention, were not the same species with those of Mexico, that they could not procure a Plant proper to feed them on, or that the people of these Colonies were not prepared to attend to the *Minutiae* of treating them like the Natives of Mexico, of which many similar instances occur in comparing the habits of people of different Countries, *e. g.* it has ever been known to the workmen in Europe, that Quick Lime, mixed with sand and water, by long exposure to the air, becomes fit mortar for building, and here the same advantage is obtained by admixture of Sugar; in both cases it acquires what supplies the place of the fixable air, and water it had lost in calcination; but it is only the workmen of this Coast who can therewith plaister a wall, with a beautiful and durable crust of artificial Marble, and make a cement equal to that of the Romans!

The ready assistance I have experienced, having been attended with as much success as I could expect, I shall now drop the subject; having fully stated the result of ten months observation. and although in a loose way, as the objects obtruded themselves on my attention; yet not without a hope, that I have suggested enough to enable those who are particularly fond of Natural Knowledge, to prosecute it still farther.

Fort St. Geogre,
Sept. 25th 1787.

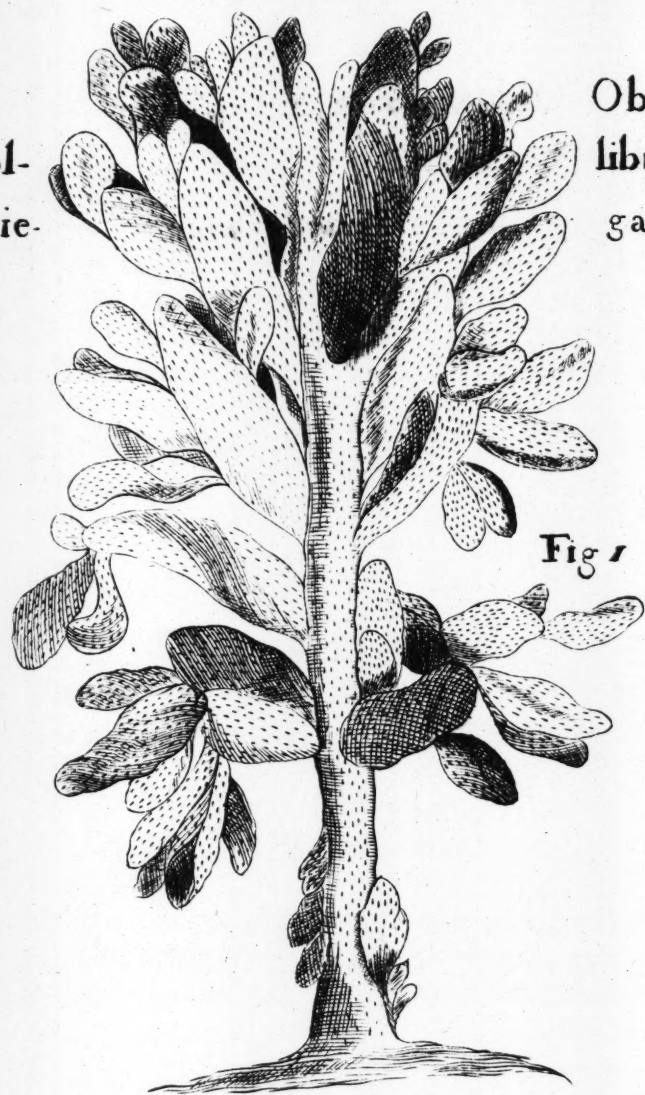
I am,
with much Sincerity, and esteem
Dear Sir,
Your very obedient
humble Servant,
JAMES ANDERSON.

(0)



*Mr. Richard Smith
No. 11. 11*

Fig 1 Opuntiamaxima folio
majore spinulis obtusis mol-
obrito, flore strijs rubris varie-
Hist.Vol. 2 p. 132.



Oblongo rotundo
libus & innocentibus
gato. Cat. Jam. p. 194

Fig. 2. Foliū et flos
ejusdem



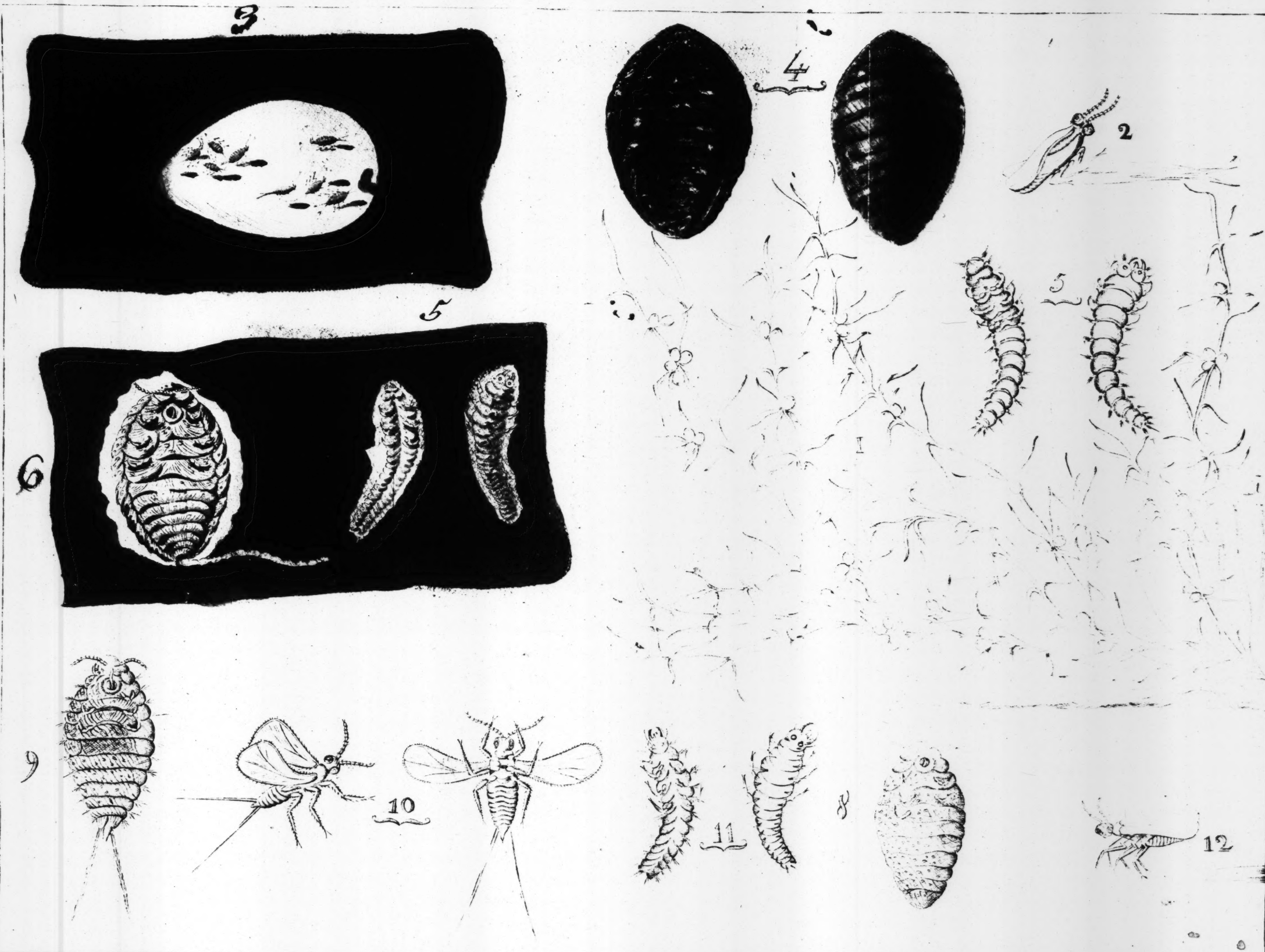
Fig. 2.

Cactus Articulado-Prolifer Articulis Ovato Oblongis Subinermibus Cactus Compressus Articulus
Ramosus Articulis Ovato-Oblongis Subinermibus Hort. ups. 121 Tuna Mitior Flore Sanguineo Cochinillifera
Dill. Ellh. 399 t. 297 f. 383 Ficus Indica Major Loevis S. spinosa Vermiculos Proferens Pluk. Att. 146 t. 281 f. 383
Fig 1 The Cochineal Thistle on a Small Scale, this plant grows to eight Feet in height
Fig 2 A leaf and Flower of the Cochineal thistle which grows to a foot and a half in length and nine Inches in breadth

Mr. Herbert
Great Marlboro St.



The Encyrtidae being extremely rare, I intended colouring this sheet, when the children arrived & departure of the Daumont worth prevented me — I will however send you a better one than this by the next opportunity



T. Reichel Del^t

J. Solier : Sculp^t

Mr. Nichol Esq
Glasgow

